**Robot Guitar**

Gibson Firebird X

The Gibson Firebird X is a state-of-the-art high tech guitar, set for a limited release of 1,800 units late-September of this year. Designed and built by Gibson, this guitar is built with the body of a Firebird, but with incredible modifications. A sophisticated electronics system housed in the body allows for analog signal modulation, as opposed to popular contemporary digital modulation. What is unique with this guitar, however, is not so much the build or the effects design, but rather the built in automatic-tuner, which acts as a helper robot. This is not the first robot guitar, but rather a 3rd edition. However, improvements have made this the most powerful and accurate robot tuner ever built into a guitar.

The tuner works by a means of components spread from the bridge to the head of the guitar. This robot is a helper, allowing for quick tuning to maximize practice and performance time, as well as making alternate tuning much quicker and practical for guitarists looking into new ways to play. [Autotuning](http://youtu.be/447d8NXqztQ?t=18s) is activated by switching a tog-pot(toggle potentiometer) on the body of the guitar and strumming the strings. Vibrations from each string are detected and converted to digital signals by a piezoelectric sensor saddle on the bridge, which feeds the signal to the microprocessor within the guitar. The signals are compared to fundamental frequencies of notes, and motors at the head adjust the knobs such that the strings vibrate at the chosen fundamental frequency. The tuning of the guitar is chosen by a knob to the right of the tog-pot, which can store up to 11 different tunings. In addition, the tuning pegs can be manually adjusted, for those experienced musicians who prefer to tune by ear. Not only does this allow for quick tuning to alternate tunings, or tuning up in general, as stated before, but this also ensures one’s guitar is tuned with high accuracy.

This is a robot in the sense that it performs some mechanical action on its own. It is a helper robot in the sense that it makes a musician’s life easier by taking a time-consuming process and performing it quickly and highly accurately. The Firebird X is not the first guitar to have a robot tuner built in. For some time, many acoustic guitars have been made with built in tuners, that most commonly are fed audio signals by a condenser microphone within the body. An automatic tuner is not practical with acoustic guitars, as the audio wave may become distorted as it passes to the microphone by overtones and reverb, as well as the fact that the components needed for an automatic tuner are impractical to mount on an acoustic guitar, and take away from the overall look as well. The strength of the automatic tuner on the robot guitar is the fact that each string has a dedicated piezoelectric pickup, and the tone comes directly from the vibrating string. In addition, the mechanical components blend in with the look of the guitar. It is possible that in the future this feature will be added to other instruments. With the technology of this day however, this is impractical. For example, violins may be too small and frail to bear the components required (single bridge, need piezoelectric sensors for accuracy; small head, no space for mechanics; pegs designed differently), while bass guitars may require too much force that is feasibly given by a tuning mechanism (thicker strings means stronger tension). Even then, the automatic tuning function has already been in use by other guitar manufacturers, in particular [Transperformance](http://www.gizmag.com/go/4951/). Nonetheless, the Firebird X is a state-of-the-art guitar with an increasingly sophisticated and powerful robotic component, the automatic tuners.

